Bruce (Shidi) Xi

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Education

The University of British Columbia **Vancouver, BC**

Master of Engineering in Electrical and Computer Engineering *2021–2024*

- Relevant courses: Deep Learning, DNN Hardware Accelerator, Computer Architectures, Digital/Microcomputer System Design, VLSI, IC Testing and Reliability

Imperial College London **London, UK**

Bachelor of Engineering in Materials Science and Engineering *2018–2021*

- Graduated with First-Class Honours
- Obtained Dean's List for three consecutive years (2018-2021)

Project

Concurrent VLSI Routing with Multi-agent Deep Reinforcement Learning **May-Oct. 2023**

- Independently mastered reinforcement learning and VLSI global routing through self-study and literature review
- Developed a novel machine learning framework to address the VLSI global routing problem in a concurrent manner, integrating multi-agent reinforcement learning with deep neural networks
- Addressed training challenges by fine-tuning hyperparameters through a grid search approach, improving performances
- Actively contributed to research group meetings by sharing project insights and progress, effectively communicating complex technical details to supervisors and peers
- The proposed work overcame the traditional net-ordering issue, guaranteed zero overflow, and outperformed an A* baseline by 2.6% in terms of wirelength

Microcomputer System Development **Jan.-Apr. 2023**

- Engineered key components of a microcomputer system including a 4-way set-associative cache and a DRAM controller using Verilog. The cache reduced the runtime of a benchmark by 43%
- Implemented the system on an Altera FPGA with a soft core provided by the course
- Developed software in C that interacted with hardware (Flash, EEPROM, and ADC/DAC) using SPI, IIC, and CAN protocol
- Utilized hardware timer interrupt and designed a snake game software that ran on the system and interact with the player using VGA

FPGA SoC Design **Jan.-Apr. 2022**

- Developed a comprehensive SoC on FPGA using Quartus, incorporating a Nios II soft processor, on-chip RAM, and custom IP cores, managed via an Avalon memory-mapped interface
- Designed and synthesized custom IP cores in Verilog for functionalities like image data processing, arithmetic acceleration and VGA output
- Created embedded software in C to perform system tasks such as performance benchmarking and control over VGA display

Experience

Motorola Solutions **Vancouver, BC**

Design Validation Co-op *May-Dec. 2022*

- Conducted extensive camera tests, ensuring precision both in lab settings and office environments
- Developed Python-based software, realizing test automation and data analysis, resulting in a significant enhancement in test efficiency. Some tests achieved automation of up to 90%
- Collaborated effectively within a team framework, leveraging tools like Git and Jira for optimal workflow management

University College London **London, UK**

Undergraduate Research Assistant *June-Aug. 2021*

- Played an integral role in the research team by meticulously taking measurements and preparing samples
- Demonstrated analytical skills by independently evaluating vast datasets and presenting insights effectively to the research group, fostering informed decision-making

Skills

Hardware: Verilog, FPGA, Modelsim, Quartus, Cadence

Software: Python > C > ARM Assembly = C++, Linux

Research: LaTeX, Academic writing, Mendeley